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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 21002413		FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE 2003/000360	International filing date (day/month/year) 07-03-2003	Priority date (day/month/year) 08-03-2002	
International Patent Classification (IPC) or national classification and IPC G01N 33/487, G01R 33/12, G01N 27/74			
Applicant LIFEASSAYS AB et al			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>2</u> sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 08-10-2003		Date of completion of this report 03-05-2004	
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88		Authorized officer Mats Raidla /itw Telephone No. +46 8 782 25 00	

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE03/00360

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☒ This report is based on a translation from the original language into the following language English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☒ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-5 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* 7-8 received by this Authority on 2004-04-26
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1-2 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-8</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-8</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-8</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: US 5025656 A  
D2: US 6110660 A  
D3: EP 11436347 A1  
D4: US 5978694 A

The cited documents represent the general state of the art.  
The invention defined in amended claims 1-8 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed drift compensated magnetic permeability detector. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in amended claims 1-8 is novel and is considered to involve an inventive step. The invention is industrially applicable.

26-04-2004

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## CLAIMS

1. A device for detection of magnetic permeability  $\mu$  or, alternatively, relative magnetic permeability  $\mu_r$  or, alternatively, relative magnetic susceptibility ( $\mu_r - 1$ ) of a sample, characterised in that it contains a sample chamber and at least two coils, said two coils surrounding said sample chamber and said sample chamber having at least one opening for introduction of a sample or a sample container holding a sample, said device also provided with an electronic circuit which measures the difference in inductance between the two coils.

2. A device as claimed in claim 1, characterised in that each of said coils, when filled with air, has an inductance in the range of 0.01 to 100  $\mu\text{H}$ .

3. A device as claimed in claim 1 or 2, characterised in that said sample chamber has a chamber volume in the range of 0.1 to 5000  $\mu\text{l}$ .

4. A device as claimed in any one of claims 1-3, characterised in that one of the coils is placed so as to be in thermal contact by being physically connected to the material which constitutes the sample chamber, but without surrounding the cavity of the sample chamber.

5. A device as claimed in any one of claims 1-4, characterised in that the material of which the sample chamber is made is a polymer, such as Delrin, POM, polyvinyl chloride, Teflon, polyamide, polyacetal, polyethylene, polycarbonate, polystyrene, polypropylene, wood, glass, or a metal with  $0.999 < \mu_r > 1.001$ .

6. A device as claimed in any one of claims 1-5, characterised in that it is provided with an electronic circuit whose output signal is proportional to the difference in inductance between said coils and to the relative magnetic permeability of the sample material

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7. A device as claimed in claim 6, c h a r a c -  
t e r i s e d in that said electronic circuit is formed  
such that said coils are part of an alternating current  
bridge.

8. Use of the device as claimed in any one of claims 1-7, by interaction with magnetic markers, for detection of chemical substances with  $\mu_r = 1$ , exemplified by proteins, hormones, complement factors, bacteria, cells, viruses, fungi, yeast, spores, phages, cells, cell organelles, DNA, RNA.